

 LG화학 나주공장 1, SONGWAL-DONG, NAJU-SI, JEOLLANAM-DO, 520-130, KOREA(Rep) Fax : 85-061-330-1354 Tel : 82-061-330-1114	Material Safety Data Sheet (MSDS)	Report version	1.1
		Revision Date	2013.03.13
	Product name: NORMALBUTYL ALCOHOL	Date	2013.03.13
		Change List	

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

A. Product identifier : NORMALBUTYL ALCOHOL BULK (NORMALBUTANOL)

B. Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses : Manufacture of chemical products, Manufacture of paints, varnishes and similar coatings, printing ink and mastics

Uses advised against : no data available

C. Details of the supplier of the safety data sheet

Company : LG Chem, Ltd.
 Address : 1, SONGWAL-DONG, NAJU-SI, JEOLLANAM-DO, 520-130, KOREA(Rep)
 Emergency telephone : 82-061-330-1114~5

2. HAZARDS IDENTIFICATION

A. Classification of the substance or mixture :
 Flammable liquids: Category 3
 Acute toxicity: Category 4
 Skin irritation: Category 2
 Eye irritation: Category 2
 Specific target organ toxicity - single exposure: Category 3
 Specific target organ toxicity - single exposure: Category 3
 Specific target organ toxicity - repeated exposure: Category 1
 Aspiration hazard: Category 2

B. Label elements

Symbol



Signal Word

: Danger

Hazard statements	: Flammable liquid and vapour. Harmful if swallowed. May be harmful if swallowed and enters airways. Causes skin irritation. Causes serious eye irritation. May cause respiratory irritation. May cause drowsiness or dizziness. Causes damage to organs (auditory sense, Central nervous system) through prolonged or repeated exposure.
Precautionary Statements	
precautionary	: P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking. P233 Keep container tightly closed. P240 Ground/bond container and receiving equipment. P241 Use explosion-proof electrical · ventilating · lighting · (...) · equipment. P242 Use only non-sparking tools. P243 Take precautionary measures against static discharge. P260 Do not breathe dust/fume/gas/mist/vapours/spray. P264 Wash skin thoroughly after handling. P270 Do not eat, drink or smoke when using this product. P271 Use only outdoors or in a well-ventilated area. P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
Response	: P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/ physician. P303 + P361 + P353 IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower. P304 + P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P314 Get medical advice/ attention if you feel unwell. P321 Specific treatment (see supplemental first aid instructions on this label). P330 Rinse mouth. P331 Do NOT induce vomiting. P332 + P313 If skin irritation occurs: Get medical advice/ attention. P337 + P313 If eye irritation persists: Get medical advice/ attention. P362 Take off contaminated clothing and wash before reuse. P370 + P378 In case of fire : Use dry sand, dry chemical or alcohol-resistant foam for extinction.
Storage	: P403 + P233 Store in a well-ventilated place. Keep container tightly closed. P403 + P235 Store in a well-ventilated place. Keep cool. P405 Store locked up.
Disposal	: P501 Dispose of contents/ container to an approved waste disposal plant.
C.Other hazards	: no data available

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS-No.	Concentration	REACH registration number
n-butyl alcohol	71-36-3	100.0%	

4. FIRST AID MEASURES

- A.following eye contact : Remove contact lenses.
Protect unharmed eye.
If eye irritation persists, consult a specialist.
- B.following skin contact : In case of skin contact
Take off contaminated clothing and shoes immediately.
If skin irritation persists, call a physician.
- C.following inhalation : If unconscious place in recovery position and seek medical
advice.
If symptoms persist, call a physician.
- D.following ingestion : Keep respiratory tract clear.
Do not give milk or alcoholic beverages.
Never give anything by mouth to an unconscious person.
If symptoms persist, call a physician.
- E.Notes to physician
- Symptoms : no data available
- Risks : no data available
- Treatment : no data available

5. FIRE-FIGHTING MEASURES

- A.Suitable extinguishing media : Use water spray, alcohol-resistant foam, dry chemical or
carbon dioxide.
- B.Unsuitable extinguishing media : no data available
- C.Specific hazards during fire fighting : no data available
- D.Special protective equipment for fire-fighters : Wear self contained breathing apparatus for fire fighting if
necessary.
- E.Further information : Standard procedure for chemical fires.
Use extinguishing measures that are appropriate to local
circumstances and the surrounding environment.

6. ACCIDENTAL RELEASE MEASURES

- A. Personal precautions : Keep people away from and upwind of spill/leak.
- B. Environmental precautions : no data available
- C. Methods for cleaning up : Wipe up with absorbent material (e.g. cloth, fleece).
Keep in suitable, closed containers for disposal.
- D. Additional advice : no data available

7. HANDLING AND STORAGE

A. Precautions for safe handling

- Advice on general occupational hygiene : For personal protection see section 8.
Smoking, eating and drinking should be prohibited in the application area.
Wear personal protective equipment.
Do not breathe vapours or spray mist.
Keep away from fire, sparks and heated surfaces.
For personal protection see section 8.
Smoking, eating and drinking should be prohibited in the application area.

- Advice on protection against fire and explosion : Normal measures for preventive fire protection.
Use only in well-ventilated areas.
Keep away from heat and sources of ignition.
Normal measures for preventive fire protection.

- Temperature class : no data available

- Fire-fighting class : no data available

- Dust explosion class : no data available

B. Conditions for safe storage, including any incompatibilities

- Requirements for storage areas and containers : Electrical installations / working materials must comply with the technological safety standards.

- Further information on storage conditions : no data available

- Advice on common storage : No materials to be especially mentioned.

- Storage period : no data available

- Storage temperature : no data available

- Incompatible materials : Oxidizing agents
reducing agent
copper alloys
Acid anhydrides
acid chloride
alkali metal
Aluminium

Copper
halogen
Organic peroxide
chromic anhydride acide

Other data : No decomposition if stored and applied as directed.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

A.Components with Workplace Parameters

Component	Regulatory Basis	Value Type	Value in PPM	Value in mg/m3
	Industrial Safety and Health Act	time weighted average	50 ppm	150 mg/m3
	US. ACGIH Threshold Limit Values	time weighted average	20 ppm	

B.Engineering measures

Handle only in a place equipped with local exhaust (or other appropriate exhaust).

C.Personal protective equipment

Respiratory protection : No personal respiratory protective equipment normally required.

Hand protection : Solvent-resistant gloves

Eye protection : Safety glasses

Skin and body protection : Protective suit

Hygiene measures : General industrial hygiene practice.

Protective measures : no data available

9. PHYSICAL AND CHEMICAL PROPERTIES

A.Appearance

Form : liquid

Colour : colourless

B.Odour : alcohol-like

C.Odour Threshold : 15 ppm

D.pH : no data available

E.Boiling point/freezing point : < -90 °C

F.Initial boiling point/ freezing : 119 °C

point

G.Flash point	: 29 °C
H.Evaporation rate	: 33
I.Flammability (solid, gas)	: no data available
J.Upper/Lower explosion limit	: $\leq 11.3 \text{ \% (V)}$ $\geq 1.4 \text{ \% (V)}$
K.Vapour pressure	: < 10 hPa(20 °C)
L.Water solubility	: 63.2 g/l
M.Relative vapour density	: 2.6 -
N.Density	: 0.8095 g/cm ³
O.Partition coefficient: n-octanol/water	: log Pow: 0.9(25 °C)
P.Autoignition temperature	: no data available
Q.Thermal decomposition	: no data available
R.Viscosity	: Dynamic 2.947 mPa.s
S.Molecular Weight	: 74.12 g/mol

10. STABILITY AND REACTIVITY

A.Hazardous reactions	: Vapours may form explosive mixture with air., Stable under recommended storage conditions. , No hazards to be specially mentioned. ,
B.Conditions to avoid	: no data available
C.Incompatible materials	: Oxidizing agents, reducing agent, copper alloys, Acid anhydrides, acid chloride, alkali metal, Aluminium, Copper, halogen, Organic peroxide, chromic anhydride acid
D.Hazardous decomposition products	: Carbon monoxide, irritating and toxic fumes and gases, carbon dioxide may cause sensitizing and toxic gas

11. TOXICOLOGICAL INFORMATION

A.Exposuer information highly possibility	: no data available
B.hazardous Information for health	
Acute toxicity	
Acute oral toxicity	:

Acute toxicity estimate: 500 mg/kg
Method: Converted acute toxicity point estimate

LD50 Oral: 2,292 mg/kg
Species: mouse
Method: OECD Test Guideline 401

Acute dermal toxicity :
LD50 Dermal: 4.24 mg/kg
Species: rabbit
Method: OECD Test Guideline 402

Acute inhalation toxicity :
LC0: > 17.76 mg/l
Exposure time: 4 h
Species: mouse
Method: OECD Test Guideline 403

Skin corrosion/irritation :
Species: rabbit
Result: Skin irritation
Classification: Irritating to skin.
Exposure time: 0.8 h

Serious eye damage/eye irritation :
Species: rabbit
Result: Eye irritation
Classification: Risk of serious damage to eyes.
Method: OECD Test Guideline 405

Respiratory sensitization :
Maximisation Test
Species: guinea pig
Classification: Did not cause sensitization on laboratory animals.
Result: No hypersensitivity (skin)
Method: Similar or qual to OECD Guideline 406

Skin sensitization : no data available

Carcinogenicity :
Carcinogenicity classification not possible from current data.

Germ cell mutagenicity :
In vivo tests did not show mutagenic effects

Genotoxicity in vitro :
in vitro assay
Result: negative
Method: OECD Test Guideline 476

Genotoxicity in vivo	:	in vivo assay Species: rat Method: OECD Guideline 474 Dose:500, 1000, 2000 mg/kg bw Exposure time:single oral application Result: negative
Teratogenicity	:	Did not show teratogenic effects in animal experiments. No toxicity to reproduction
Target Organ Systemic Toxicant - Single exposure	:	Exposure routes: Inhalation Target Organs: Respiratory organs Remarks: May cause respiratory irritation.
Target Organ Systemic Toxicant - Repeated exposure	:	Exposure routes: Ingestion Remarks: The substance or mixture is not classified as specific target organ toxicant, repeated exposure.
Aspiration toxicity	:	no data available

12. ECOLOGICAL INFORMATION

A.Ecotoxicity

toxicity to fish	:	LC50: 1,376 mg/l Exposure time: 96 h Species: Pimephales promelas (fathead minnow) static test Analytical monitoring: yes Method: OECD Test Guideline 203
Toxicity to aquatic invertebrates	:	EC50: 1,328 mg/l Exposure time: 48 h Species: Daphnia magna (Water flea) static test Analytical monitoring: yes Method: OECD Test Guideline 202
Toxicity to aquatic plants	:	EC50: 225 mg/l Exposure time: 96 h Species: Scenedesmus capricornutum (fresh water algae) static test

Analytical monitoring: yes
Method: OECD Test Guideline 201

Chronic toxicity to fish : no data available

Chronic to aquatic invertebrates :
NOEC: 4.1 mg/l
Exposure time: 21 d
Species: Daphnia magna (Water flea)
Analytical monitoring: yes
Method: OECD Guideline 211

B.Environmental absorption and degradation

absorption : no data available

degradation(BOD) : no data available

degradation(COD) : no data available

C.organism condensability

condensability : no data available

Biodegradability :
aerobic
Result: Readily biodegradable.
92 %

D.Mobility : no data available

E.Additional ecotoxicological : no data available

13. DISPOSAL CONSIDERATIONS

A.Method of disposal : no data available

B.Advice on disposal : no data available

14. TRANSPORT INFORMATION

A.UN Number : 1120

B.Proper shipping name : Butanols

C.Hazard class : 3

D.Packing group : 2

E.Marine pollutant : Not applicable

F.security arrangements on transport

In case of fire : See Section 5. of this document.

In case of accidental release : See Section 6. of this document.

15. REGULATORY INFORMATION

A.Information according to ISHA

Regulation	composition	Value Type	Value	Unit	Remark
ISHA 166 Hazardous Chemical Substances subject to be Controlled (MoL)	butan-1-ol	Threshold limits	> 1	Vol-%	
substance with exposure limit					

B.Information according to TCCA and other chemical management regulations

Regulation	composition	Value Type	Value	Unit	Remark
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C.Dangerous Substances Safety Management Act

Dangerous Materials Control Act (Fire Service Act) : Flammable liquids, Type 2 petroleums, Water insoluble liquid

D.Regulation of Disposal

Regulation	composition	Value Type	Value	Unit	Remark
controlled wastes under Korean Wastes Control Act					

E.Other regulations

Regulation	composition	Value Type	Value	Unit	Remark
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16. OTHER INFORMATION

A.References (source of data) : C. Odor Threshold (2)
(4)
F. Initial boiling point/ freezing point (4)
G. Flash point (4)
H. Evaporation Rate (2)
J. Upper explosion limit (2)
J. Lower explosion limit (2)
K. Vapor pressure (4)
L. Solubility in water (3)
N. Density (4)
O. Partitioning coef. octanol/water (4)

R. Viscosity (4)
 S. Molar mass (3)
 A. Hazardous reactions (2)
 C. Substances to avoid (SDS) (2)
 D. Decomposition products (2)
 D. Decomposition products (3)
 Acute oral toxicity (4)
 Acute oral toxicity (1)
 Acute dermal toxicity (4)
 Acute Inhalation Toxicity (4)
 Skin irritation (4)
 Eye irritation (4)
 Respiratory sensitization (4)
 Genetic toxicity (4)
 Genetic toxicity (4)
 Teratogenicity (4)
 Assessment STOT - Single Exposure (4)
 Assessment STOT - Repeated Exposure (4)
 toxicity to fish (4)
 Toxicity to aquatic invertebrates (4)
 Toxicity to aquatic plants (4)
 Chronic to aquatic invertebrates (4)
 absorption (4)
 Biodegradation (4)

- (1) The Chemical Database -The Department of Chemistry at the University of Akron;
<http://ull.chemistry.uakron.edu/erd/>
 (2) REACH information on registered substances;
<http://apps.echa.europa.eu/registered/registered-sub.aspx>
 (3) U.S. National library of Medicine(NLM) Hazardous Substances Data Bank(HSDB);
<http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB>
 (4) Acute toxicity point estimate based on EU GHS classification data
 (5) EH&S-Expert

B.Date of initial publication : 2013.03.13

C.Revision number and date of the last modification

Revision number : 1
 Date of the last :
 modification

D.Remark :

Product should be handled, stored, and used in accordance with the generally accepted industrial hygiene practices and in conformity with all the applicable legal regulations.
 The information provided herein is based on the state of our knowledge and is intended to describe the product with regard to the requirements of safety.
 It should, therefore, not be construed as guaranteeing specific properties.